REMARKS

Claims 1, 3, 4, 6-8, 15, 16, 18, and 20 are pending in the application upon entry of the amendments. Claim 1 has been amended to incorporate the subject matter of claim 5 into claim 1. Claims 5, 9-14, 17, and 19 have been canceled to delete the subject matter inserted into claim 1 and/or to delete improper dependency. Since the amendments place the application in condition for allowance, do not require new searching, and/or remove issues in the event of an appeal, entry is respectfully requested. Favorable reconsideration in light of the amendments and the remarks which follow is respectfully requested.

Claim Objection

Claims 9, 10, 13, 14, 17, and 19 have been objected to under 37 CFR § 1.75(c) for improper dependency. Claims 9, 10, 13, 14, 17, and 19 been canceled. Withdrawal of this objection is respectfully requested.

Art Rejection I

Claims 6-8, 15, 16, 18, and 20 have been rejected under 35 U.S.C. § 102(e), or in the alternative, under 35 U.S.C. § 103(a) over Wu et al. (US Patent No. 6,770,572, hereinafter "Wu"). Wu relates to a process for treating a silica film involving reacting the silica film with a surface modification agent (Abstract of Wu).

In order to establish anticipation, each and every feature as set forth in the claim must be disclosed in a single cited art document. To reject claims in an application under § 103, an examiner must establish a *prima facie* case of obviousness. In order to establish a *prima facie* case of obviousness, the cited art reference or references when combined must teach or suggest all claim features. *See* MPEP § 706.02(j).

The claimed invention relates to modified porous films. Claim 6 depends on claim 1 and recites *the organic silicon compound is a* ***cyclic siloxane*** and *the contacting is carried out in* ***a gas phase***. The modified porous films advantageously exhibit low relative permittivity and high elastic modules since the modified porous films are obtained by contacting the porous films with a cyclic siloxane in a gas phase.

Wu fails to disclose, teach, or suggest contacting a porous film with a cyclic siloxane. As the Examiner concedes at page 3 of the previous Office Action dated October 17, 2007, Wu does not explicitly disclose a cyclic siloxane. The Examiner, however, contends that Wu inherently discloses a cyclic siloxane, alleging that the formulas on column 6 of Wu may include a cyclic siloxane and that a hydrolysis product of silane may include a cyclic siloxane. Applicants respectfully disagree.

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *See* MPEP § 2112 quoting *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.'" *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991). The fact that a characteristic may be present in the cited art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was [not] based on ... what was necessarily present in the prior art).

In Wu, "the silica film is exposed to a vapor phase material that includes a **monomer** for forming a polymer/oligomer surface modification agent" (column 7, lines 66-column 8, line 1 of Wu). Wu is, however, silent as to reaction conditions under which the polymer/oligomer surface modification agent is formed from the monomer. Whether or not a cyclic siloxane is formed in the vapor phase largely

depends on the reaction conditions. Since the Examiner does not address the reaction conditions, it is submitted that the Examiner has not provided a sufficient basis in fact and/or technical reasoning to reasonably support an inherency assertion of a cyclic siloxane based on the teachings of Wu. Therefore, Wu fails to disclose, teach, or suggest contacting a porous film with a cyclic siloxane. Since Wu fails to disclose, teach, or suggest all the claim features, Wu does not anticipate the claims and does not render the claims obvious.

Contacting a porous film with a cyclic siloxane, the claimed modified porous film advantageously exhibits low relative permittivity and high elastic modules. In this connection, the Examiner's attention is respectfully directed to Example 2 of the subject specification and Example 7 of Wu. While Example 2 of the subject specification employs a cyclic siloxane, Example 7 of Wu uses a hydrolyzed MTAS (methyltriacetoxysilane). A modified porous film of Example 2 exhibits relative permittivity of 2.2 and elastic modulus of 8.4 GPa (Table 1 of the subject specification). In contrast, although a film of Example 7 of Wu has similar relative permittivity of 2.4 to Example 2 of the subject specification, the film has elastic modulus of only 6.3 GPa. While Example 7 of Wu exhibits a highest cohesive strength in its disclosure, the elastic modulus of Example 7 of Wu is significantly lower than Example 2 of the subject specification. This is because the claimed modified porous film is made by contacting the porous film with a cyclic siloxane that is different from a hydrolyzed MTAS of Wu.

Wu fails to disclose, teach, or suggest a cyclic siloxane as recited in claim 1, and therefore Wu's film does not have high elastic modules as well as low relative permittivity. In other words, the claimed modified porous film possesses high elastic modules property and low relative permittivity property not possessed by the cited art. Superiority of properties shared with the cited art is evidence of nonobviousness. *See* MPEP § 716.02(a). For this additional reason, the cited art does not render claims 6-8, 15, 16, 18, and 20 obvious.

Art Rejection II

Claims 1, 3-5, 11, and 12 have been rejected under 35 U.S.C. § 103(a) over Wu. As discussed in the previous section, Wu fails to disclose, teach, or suggest all the claim features. In particular, Wu fails to disclose, teach, or suggest contacting a porous film with a cyclic siloxane in a gas phase.

In addition, claim 1 recites *conducting* ***a thermal treatment at a temperature from 100 °C to 600 °C*** *to the porous film, wherein* ***in the thermal treatment, the porous film is brought into contact with an organic silicon compound***. Wu fails to teach or suggest such features.

As the Examiner concedes at page 3, lines 9-12 of the Official Action, Wu requires a two-step process in which "the organosilicon is vaporized by reduced pressure and contacted with the substrate followed by thermal treatment." In other words, in Wu, the first step includes organosilicon vaporization and contacting the substrate with the organosilicon vapor, and the second step includes thermal treatment. The Examiner, however, contends that "the boiling points of the organosilicon compounds in Wu are within the temperature range of the claimed thermal treatment" (page 3, lines 6-8 of the Official Action). Applicants respectfully disagree.

Wu teaches that "a suitable vapor phase monomer will exhibit a satisfactory boiling point" (column 8, line 6 and 7) and teaches numerous monomers. Wu, however, does not teach temperatures of the boiling points. Monomer's boiling points may or may not be within the temperature range of the claimed thermal treatment. Moreover, even assuming that the monomer's boiling point is within the claimed temperature range, Wu does not teach or suggest that the temperature of the monomer's boiling point is maintained when the substrate is brought into contact with the monomer. Thus, the boiling point temperature of the monomer may or may not be maintained. As discussed above, the fact that the boiling temperature may be present in the cited art is not sufficient to establish the inherency of that result. *See* MPEP § 2112.

In addition, the second step of thermal treatment of Wu is not to react the organosilicon compound with the substrate. The second step is "to drive off remaining surface modification agent" (column 9, lines 18-20 of Wu). In other

words, the second step of Wu is NOT equivalent to the claimed thermal treatment. Thus, Wu fails to disclose, teach, or suggest conducting a thermal treatment at a temperature from 100 °C to 600 °C to the porous film, wherein in the thermal treatment, the porous film is brought into contact with an organic silicon compound, as recited in claim 1.

In view of the foregoing, withdrawal of the rejection is respectfully requested.

Art Rejection III

Claims 1-20 have been rejected under 35 U.S.C. § 103(a) over Martin (US Patent No. 6,674,140) in view of Smith et al. (US Patent No. 6,395,651, hereinafter "Smith"). Martin relates to a process for forming durable anti-stiction surfaces on micromachined structures while they are still in wafer form (column 1, lines 55-57 of Martin). Smith relates to a process for forming producing a nanoporous silica film.

The Examiner contends that it would have been obvious to one skilled in the art to replace the wafer of the micromachined structure of Martin with a nanoporous silica film of Smith to arrive at the claimed invention. Applicants respectfully disagree for the following reasons.

The proposed combination of Martin and Smith would change the principle of operation of the cited art invention being modified. *See* § MPEP 2143 VI (THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE). Martin relates to a process for forming durable anti-stiction surfaces on micromachined structures such as microelectromechanical systems (MEMS) and micro-opto-electro-mechanical systems (MOEMS) (column 1, lines 13-15 of Martin). The micromachined structures are in wafer form (column 1, lines 55-57 of Martin). Materials for such microstructures require a high degree of mechanical strength and excellent processability to form micromachined structures.

In contrast, the nanoporous silica film of Smith has a significantly lower degree of strength as compared with single-crystal silicon since it is made of

amorphous silica and has nanopores. Moreover, the nanoporous silica film significantly lowers processability if it is formed on the micromachined structure. The wafer of the micromachined structure and the nanoporous silica film are not interchangeable due to the differences in mechanical strength and processability. Thus, the amorphous nanoporous silica film can not be used in micromachined structures. It would have been obvious to one skilled in the art that such amorphous nanoporous silica is not suitable for MEMS and MOEMS.

The cited art references teach away from the proposed replacement since Martin's wafer of micromachined structure requires high mechanical strength and processability and Smith's nanoporous silica film has low mechanical strength and exhibits low processability for processing a micromachined structure. Moreover, Smith's nanoporous film must NOT be used as a substrate in the Martine process, in which a high stiction wafer surface is converted to a low stiction wafer surface by depositing a low stiction organo silicon layer because Smith's nanoporous film has a low stiction surface. The proposed combination, therefore, cannot make the subject claims obvious. See *KSR v. Teleflex*, 550 U.S. ___, 127 S. Ct. 1727 (2007) citing *United States v. Adams*, 383 U. S. 39, 51-52 (1966) (stating "[w]hen the cited art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be non-obvious").

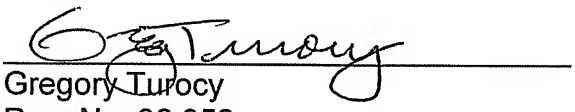
In view of the foregoing reasons, withdrawal of this rejection is respectfully requested.

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063.

Respectfully submitted,

AMIN, TUROCY & CALVIN, LLP



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